The next generation of aroma hops

NEW VARIETY | The new hop aroma variety "Nobella" from Hopsteiner combines a classic, traditional noble hop flavour with consistent alpha acid levels and reliable performance under today's climate conditions, bridging tradition and future requirements in aroma hop breeding.

ENSURING CONSISTENT raw material quality is becoming increasingly challenging. Climate change is intensifying heat and drought stress, increasing disease pressure and driving strong year-to-year variability across all aroma hop varieties.

Within aroma hops, noble hops represent a highly valued subgroup widely associated with Saaz, Tettnanger, Spalter and Hallertauer Mittelfrüher. They are prized for delicate, refined aroma profiles and their role in classic beer styles [1]. However, these varieties are increasingly challenged by today's growing conditions. Compared with other aroma hops, they show greater variability in yield and alpha acid content and higher sensitivity to environmental stress. This limits their reliability both in the field and in the brewhouse.

At the same time, brewers expect aroma hops to deliver a classic flavour profile as well as a certain contribution to bitterness, similar to established varieties such as Hallertauer Tradition.

› Hopsteiner breeding program

Hopsteiner has been a pioneer in hop breeding for decades and has introduced a broad range of hop varieties, each developed with a clearly defined brewing purpose (fig. 1). This long-term breeding strategy reflects the company's focus on combining brewing relevance with agronomic reliability.

Before a new hop variety is introduced to the market, breeding lines undergo extensive evaluation across three key dimensions:

- Agronomic robustness, including high resistance to disease as well as tolerance to drought and heat stress.
- Field and quality performance, ensuring high and stable yields combined with consistent bitter and aroma profiles.
- Brewing validation, which requires in-depth internal and external brewing trials to confirm that bitterness and flavour profiles meet the expectations of brewers and consumers.

From the initial cross to market introduction, this development process traditionally takes up to ten years. However, the use of advanced sequencing and marker-based selection techniques to identify key genetic traits aligned with defined breeding goals can significantly accelerate this timeline, reducing development cycles to approximately six to seven years under ideal conditions [2].

To further strengthen this approach, the establishment of an in-house propagation unit marks an important milestone in Hopsteiner's breeding and cultivation strategy. This new facility ensures rapid, flexible and contamination-free multiplication of high-quality plant material via in-vitro culture under controlled growth chamber production [3].

› Growing performance of Nobella

Multi-year trials across European hop regions confirm strong and stable performance. Nobella delivers consistently high yields of 2,500–3,000 kg/ha, with yield potential up to 25% higher than traditional noble varieties, while maintaining its noble aroma profile.

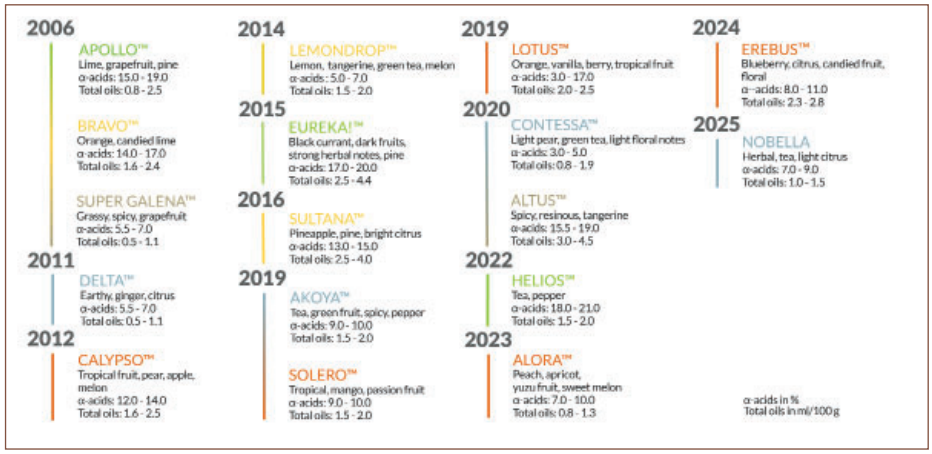

Fig. 1 Timeline and introduction of launched varieties from Hopsteiner

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The variety shows excellent heat and drought tolerance, stable alpha acid levels with less than 1% fluctuation across locations and years. Furthermore, a strong resistance to powdery mildew, a good tolerance to downy mildew and a moderate tolerance to *Verticillium* wilt has been observed.

Overall, a high yield potential and favourable disease profile reduce crop risk and input intensity, resulting in a lower carbon footprint per unit of hop produced compared with traditional noble hops and older aroma varieties (table 1).

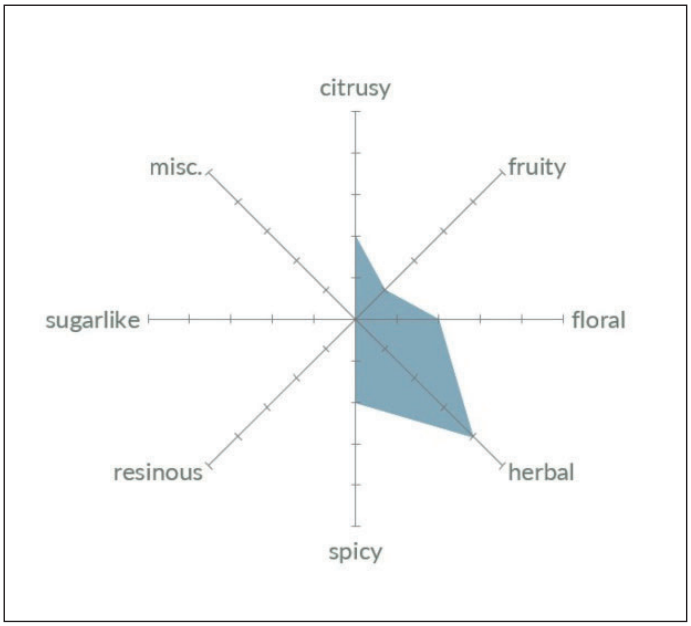
› Hop characteristics – bitter components

The averaged lead conductance value, acc. to EBC Analytica 7.5, to determine the hop's bitter content is 7.6 % (table 2).

This value covers all bittering substances and is mostly used to calculate the hop dosage in the brewhouse. Pure alpha acids account for 6.7 %, and a lead conductance value of 7.0 % has been observed using toluene according EBC Analytica 7.4. This method is used to monitor raw hop values within the crop years of recent decades [4]. In this context, Nobella is in the middle range of major German aroma varieties such as Hallertauer Tradition and Perle. Due to their relatively high bittering value, these varieties are often used for early kettle hop additions to partially, or even exclusively, achieve the beer's bitterness. Nobella can be used in a similar way here to the existing varieties. In contrast to the group of noble hop varieties, Nobella has a substantially higher concentration of bitter substances. This means it can achieve the same bitter units in the final beer at a drastically reduced hop addition.

Based on the current data, about 13 % of Nobella's bitter substances is comprised of 'non-alpha bitterness', which consists of unspecified soft and hard resins. The value is calculated by dividing the results of two methods, EBC Analytica 7.5 and 7.7 [5]. Besides alpha acids, this fraction additionally contributes to the bitterness in beer and is advantageous for the sensory bitter perception [6]. The higher the content of the 'non-alpha bitterness' introduced during wort boiling, the more the resulting bitterness in beer is described as smooth, "well-rounded" and of excellent quality, even for beers of 30 IBU or more.

Fig. 2
Aroma profile of Nobella (raw hops)



The xanthohumol content is moderate (0.7 % on average), beta acids are slightly above 5 % and total polyphenols (not shown) typically vary from 4.5 to 5.5 %, similar to major aroma varieties.

NOBELLA GROWTH PERFORMANCE

Yield [kg/ha]	2,500–3,000
Alpha content [%]	7–9
Bitter content variation [%]	< 1.0
Plant protection	Less application needed

Table 1

› Hop characteristics – aroma components

The average hop oil content is 1.2 ml/100 g (table 3).

The relative concentration of linalool in Nobella is 1.1 %, which is quite high for classic aroma varieties. This terpene alcohol is the key aroma component for late-hopped beers. Due to a high concentration of hop oil and particularly of linalool, late hop additions can be significantly reduced if Nobella is used as a replacement for other aroma varieties. It should be noted that Nobella does not contain farnesene unlike some classic and noble hop varieties that originate from the Saaz family. However, it is rarely possible to detect farnesene in beer after regular kettle hopping. Hence, this aroma substance indicates the genetic origin of a hop variety but does not dominate the flavour of kettle-hopped or late-hopped beers. Thiols are not present in Nobella and the variety's thiol impact is categorised as "low", which is the same for the vast majority of classic hops and all noble aroma hops [7].

Beyond the analysis, Fig. 2 shows the spider diagram including the key flavour descriptions of today's sensory raw hop evaluation. The overall dominating character is very similar to the typical description for noble hops. In particular, Nobella is often described as having attributes such as "herbal", "tea-like" and slightly "citrusy".

› Outlook and variety approval

Every brewery has its own brands with unique hop recipes. Hops play a major role in differentiating the beers on the market, especially when it comes to the aroma, which can be subtle or intense, depending on the respective beer style. To preserve and improve this uniqueness, beer production must remain innovative to meet the challenges of the future.

This also applies to the raw materials. Existing hop recipes should be reviewed to develop medium-term strategies to change to new, sustainable and climate-tolerant hop varieties. Once a suitable hop variety has passed the testing phase, establishing a new hopping recipe has

BITTER COMPONENT ANALYSIS (CROP 2023 TO 2025)

Lead Conductance Value		HPLC EBC 7.7			
EBC 7.4	EBC 7.5	Alpha Acids	Co-Humulone	Beta Acids	Xanthohumol
7.0	7.6	6.7	40.1	5.3	0.7

All values in % except co-humulone ratio (% rel.)

Table 2

HOP OILS AND AROMA COMPONENT ANALYSIS (CROP 2023 TO 2025)

Hop Oil Content EBC 7.10 [ml/100 g]	Aroma Components EBC 7.12 [% rel.]			
	Myrcene	Caryophyllene	Humulene	Linalool
1.2	49.3	3.8	14.9	1.1

Table 3

proven most successful with a gradual transition.

To support this process, Nobella's acreage has been increased fivefold for the upcoming 2026 crop. The variety is cultivated at multiple locations in Central Europe, and sufficient quantities are already available to start initial brewing trials from pilot to commercial scale applications.

› Summary

Nobella demonstrates the potential of next-generation aroma hops by combining noble flavour heritage with modern agronomic performance. For growers, disease resistance and climate tolerance ensure reliable alpha acid supply and higher yields. For brewers, Nobella not only offers a fine and noble hop aroma, but also a mid-range level of alpha acids for bitterness and a high linalool content, which enables early and late hopping with reduced hop dosages. This results in lower wort losses, and in particular lower transport volumes and storage requirements.

Nobella represents a new generation of aroma hops, combining noble flavour heritage with the modern performance, efficiency and resilience, thus meeting today's demands of growers and brewers. ■

› References

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